



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
30.01.2008 Bulletin 2008/05

(51) Int Cl.:
G03F 7/20 (2006.01)

(43) Date of publication A2:
21.03.2007 Bulletin 2007/12

(21) Application number: **06120641.3**

(22) Date of filing: **14.09.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

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(30) Priority: **16.09.2005 US 717240 P**
06.03.2006 US 367693

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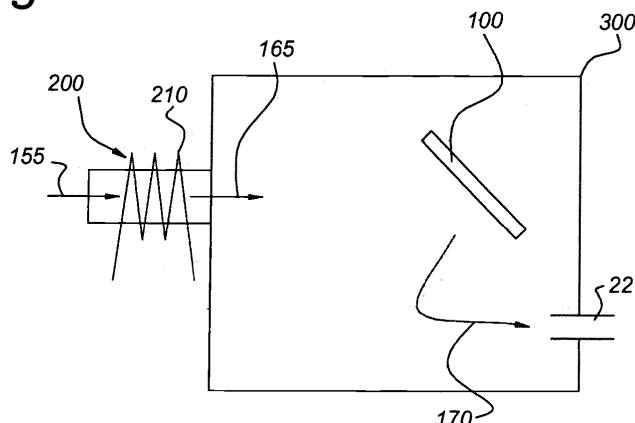
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(54) **Lithographic apparatus comprising an electrical discharge generator and method for cleaning an element of lithographic apparatus**

(57) A method for cleaning elements of a lithographic apparatus, for example optical elements such as a collector mirror, includes providing a gas (155) containing nitrogen; generating nitrogen radicals from at least part of the gas, thereby forming a radical containing gas (165);

and providing at least part of the radical containing gas to the one or more elements of the apparatus. A lithographic apparatus includes a source (SO) and an optical element (100), and an electrical discharge generator (200) arranged to generate a radio frequency discharge.

Fig 3





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 06 12 0641

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 429 189 A (ASML NETHERLANDS BV [NL]) 16 June 2004 (2004-06-16) * paragraphs [0016], [0031], [0042] * * figure 2 *	12-22	INV. G03F7/20
X	US 2004/007246 A1 (CHAN MICHAEL [US] ET AL) 15 January 2004 (2004-01-15) * paragraph [0020] * * figures 1-4 *	12,13, 15-20, 22-31	
X	US 2005/139785 A1 (BANINE VADIM Y [NL] ET AL BANINE VADIM YEVGENYEVICH [NL] ET AL) 30 June 2005 (2005-06-30) * paragraphs [0022], [0023] * * figure 2 *	23-25,31	
X	EP 1 223 468 A (ASML NETHERLANDS BV [NL]) 17 July 2002 (2002-07-17) * paragraphs [0034], [0035] * * figure 3 *	23-25,31	
A	EP 0 997 761 A (NIPPON KOGAKU KK [JP]) 3 May 2000 (2000-05-03) * paragraphs [0010], [0034], [0035] * * figure 1 *	1-31	TECHNICAL FIELDS SEARCHED (IPC) G03F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 December 2007	Examiner Adams, Richard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

3
EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 12 0641

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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13-12-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1429189	A	16-06-2004	NONE
US 2004007246	A1	15-01-2004	US 2006000489 A1
US 2005139785	A1	30-06-2005	JP 2007517396 T
		WO 2005064411	A2 14-07-2005
EP 1223468	A	17-07-2002	NONE
EP 0997761	A	03-05-2000	AU 7552498 A
		WO 9857213	A1 17-12-1998
		US 6288769	B1 11-09-2001